Gerald Amiel Ballena

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Professional Summary

Bioinformatics specialist with extensive experience in developing scalable workflows for high-throughput sequencing data, single-cell analysis, and visualization tools. Proven expertise in automating data pipelines, ensuring reproducibility, and delivering actionable results for public health and environmental research.

Experience

Project Technical Specialist (Contract) *University of the Philippines, College of Public Health*
2024 – Present

- Designed scalable metagenomics pipelines for microbial community profiling, integrating tools like **Kraken2**, **Bracken**, and **scikit-bio**.
- Automated preprocessing and trimming workflows using **Snakemake**, enhancing reproducibility and reducing manual effort by 90%.
- Developed modular workflows for taxonomic profiling, diversity analysis, and functional annotation.
- Visualized complex biological datasets using tools like **ggplot2**, **Plotly**, and **Shiny**.
- Collaborated with multidisciplinary teams to analyze high-dimensional sequencing data and present findings for research publications.

Key Projects

..... GitHub Link

- **Single-Cell Workflow Development:** Designed Python and R pipelines for preprocessing, integration, and visualization of single-cell datasets.
- **K-mer and Shannon Entropy Analysis:** Quantified sequence complexity using entropy metrics for diversity assessment across datasets.
- **Metagenomic Workflow Automation:** Built Snakemake pipelines for reproducible analysis of multi-terabyte sequencing datasets.

Certifications

- AI Fundamentals ..... Nov 2024
- Intermediate R ..... Nov 2024
- RNA-Seq with Bioconductor in R ..... Nov 2024

Education

University of the Philippines Diliman
Graduated: July 2022
Thesis: *In silico assessment of the association of pathogenicity and metal-resistance potential of Fusarium spp.* .Preprint Link
Accomplishments: DOST ASTHRDP-Scholarship

University of the Philippines Baguio
Graduated: June 2018
Thesis: *Bioelectrocatalysis by Novel Electrogenic Alkaliphilic Bacteria Bacillus sp. BAB-3442 Using Dual-Chambered Microbial Fuel Cell* ..... Poster Presentation (`PSM 47`)

Skills

Programming

Python, R, Bash

Bioinformatics Tools

- **Single-Cell Analysis:** scikit-learn
- **Metagenomics:** Kraken2, MetaPhlAn, HUMAnN
- **Assembly and Binning:** MEGAHIT, MetaWRAP, CheckM
- **Annotation:** Prokka, EggNOG-mapper, KEGG
- **Quality Control:** FastQC, Trimmomatic, Cutadapt, BUSCO
- **Phylogenetics:** RAxML, FastTree, IQ-TREE

Data Analysis & Visualization

- **Visualization:** ggplot2, Plotly, Shiny, matplotlib
- **Machine Learning:** scikit-learn, caret (R)

Technical Skills

- **Version Control:** Git, GitHub
- **Workflow Automation:** Snakemake, Conda, YAML
- **Virtualization:** Docker, WSL2
- **Cloud Computing:** AWS, GCP (Familiarity)

For a more detailed documentation of the scripts visit this link.

References

Available upon request and if shortlisted.